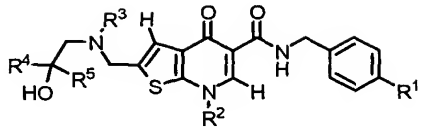
CLAIMS

We Claim:

1. A compound of formula I



I

its enantiomeric, diasteromeric or tautomeric isomer, or a pharmaceutically acceptable salt thereof wherein,

R^1 is

(a) Cl,

(b) Br,

(c) F, or

(d) CN;

R^2 is

(a) C_{1-4}alkyl optionally substituted by one or more OH or C_{1-4}alkoxy, or

(b) $(CH_2)_mOCH_2CH_2OH$;

R^3 is C_{1-2}alkyl;

R^4 is a five- (5) membered heteroaryl bonded via a carbon atom having one (1), two (2), or three (3) heteroatoms selected from the group consisting of O, $S(O)_m$, and N-W, wherein R^4 is optionally fused to a benzene or pyridine ring, and optionally substituted with one or more R^6;

wherein W is absence, H, or C_{1-4}alkyl;

R^5 is

(a) H, or

(b) C_{1-2}alkyl optionally substituted by OH;

R^6 is

(a) halo,

(b) OCF_3,

(c) cyano,

(d) nitro,

(e) $CONR^7R^8$,

(f) NR^7R^8,

(g) C_{1-7}alkyl, which is optionally partially unsaturated and is optionally substituted by one or more R^9,

(h) $O(CH_2CH_2O)_nR^{10}$,

(i) OR^{10},

(j) CO_2R^{10}, or

(k) phenyl optionally substituted by halo, C_{1-7}alkyl, or C_{1-7}alkoxy;

R^7 and R^8 are independently

(a) H,

(b) phenyl optionally substituted by halo, C_{1-7}alkyl, or C_{1-7}alkoxy,

(c) C_{1-7}alkyl which is optionally substituted by one or more OR^{10}, phenyl, or halo substituents,

(d) C_{3-8}cycloalkyl,

(e) $(C=O)R^{11}$, or

(f) R^7 and R^8 together with the nitrogen to which they are attached form a het, wherein het is a five- (5), or six- (6) membered heterocyclic ring having 1, 2, or 3 heteroatoms selected from the group consisting of oxygen, sulfur, or nitrogen, wherein het is optionally substituted with C_{1-4} alkyl;

R^9 is

(a) oxo,

(b) phenyl optionally substituted by halo, C_{1-7}alkyl, or C_{1-7}alkoxy,

(c) OR^{10},

(d) $O(CH_2CH_2)OR^{10}$,

(e) SR^{10},

(f) NR_7R_8,

(g) halo,

(h) CO_2R^{10},

(i) $CONR^{10}R^{10}$, or

(j) C_{3-8}cycloalkyl optionally substituted by OR^{10};

R^{10} is

(a) H,

(b) C_{1-7}alkyl,

(c) C_{3-8}cycloalkyl, or

(d) phenyl optionally substituted by halo, C_{1-7}alkyl, or C_{1-7}alkoxy;

R^{11} is

(a) C_{1-7}alkyl,

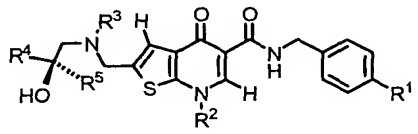
(b) C_{3-8}cycloalkyl, or

(c) phenyl optionally substituted by halo, C_{1-7}alkyl, or C_{1-7}alkoxy;

n is 1, 2, 3, 4 or 5; and

each m is independently 1 or 2.

2. A compound of claim 1 which is a compound of formula IA



IA.

3. A compound of claim 1 or 2 wherein R^1 is chloro.

4. A compound of claim 1 or 2 wherein R^2 is C_{1-3}alkyl.

5. A compound of claim 1 or 2 wherein R^2 is methyl.

6. A compound of claim 1 or 2 wherein R^2 is C_{1-3}alkyl substituted with one or two hydroxy.

7. A compound of claim 1 or 2 wherein R^2 is C_{1-4}alkyl substituted by C_{1-4}alkoxy.

8. A compound of claim 1 or 2 wherein R^2 is $CH_2CH_2OCH_2CH_2OH$.

9. A compound of claim 1 or 2 wherein R^3 is methyl.

10. A compound of claim 1 or 2 wherein R^3 is ethyl.

11. A compound of claim 1 or 2 wherein R^4 is a five- (5) membered heteroaryl bonded via a carbon atom having one (1) or two (2) heteroatoms selected from the group consisting of O, S, and N-W.

12. A compound of claim 11 wherein R^4 is substituted by R^6.

13. A compound of claim 11 wherein R^4 is 2-furyl, 3-furyl, thien-2-yl, 1*H*-pyrrol-2-yl, 1-methyl-1*H*-pyrrol-2-yl, 1-methyl-1*H*-imidazol-4-yl, 1*H*-imidazol-4-yl, 1,3-thiazol-2-yl, or 1*H*-pyrazol-5-yl.

14. A compound of claim 13 wherein R^4 is 2-furyl.

15. A compound of claim 12 wherein R^4 is 5-methyl-2-furyl, 2,5-dimethyl-3-furyl, 5-phenyl-2-furyl, 5-chloro-2-furyl, 4,5-dimethyl-2-furyl, or 5-cyanothien-2-yl.

16. A compound of claim 1 or 2 wherein R^4 is a five- (5) membered heteroaryl bonded via a carbon atom having one (1) or two (2) heteroatoms selected from the group consisting of O, S, and N-W, wherein R^4 is fused to a benzene or pyridine ring.

17. A compound of claim 16 wherein R^4 is substituted by R^6.

18. A compound of claim 16 wherein R^4 is benzofuran-2-yl, benzothien-3-yl, 1*H*-indol-3-yl, 1-methyl-1*H*-indol-2-yl, or 1,3-benzothiazol-2-yl.

19. A compound of claim 18 wherein R^4 is benzofuran-2-yl.

20. A compound of claim 1 or 2 wherein R^5 is hydrogen.

21. A compound of claim 12 wherein R^6 is OH, halo, C_{1-4}alkyl, C_{1-4}alkoxy, cyano, nitro, OCF_3, NR^7R^8, phenyl, or $CONR^7R^8$.

22. A compound of claim 17 wherein R^6 is OH, halo, C_{1-4}alkyl, C_{1-4}alkoxy, cyano, nitro, OCF_3, NR^7R^8, phenyl, or $CONR^7R^8$.

23. A compound of claim 21 wherein R^6 is methyl.

24. A compound of claim 22 wherein R^6 is methyl.

25. A compound of claim 21 wherein R^7 and R^8 together with the nitrogen to which they are attached form a het, wherein het is morpholine, piperidine, piperazine, or pyrrolidine.

26. A compound of claim 22 wherein R^7 and R^8 together with the nitrogen to which they are attached form a het, wherein het is morpholine, piperidine, piperazine, or pyrrolidine.

27. A pharmaceutical composition comprising a compound of claim 1 and a pharmaceutically acceptable carrier.

28. A method of treating infections by herpesviruses which comprises administering to a mammal in need thereof a compound of claim 1 or 2.

29. The method of claim 28 wherein said herpesviruses is herpes simplex virus types 1, herpes simplex virus types 2, varicella zoster virus, human cytomegalovirus, Epstein-Barr virus, human herpes viruse 6, human herpes viruse 7 or human herpes viruse 8.

30. The method of claim 28 wherein said herpesviruses is human cytomegalovirus.

31. The method of claim 28 wherein said herpesviruses is varicella zoster virus or Epstein-Barr virus.

32. The method of claim 28 wherein said herpesviruses is herpes simplex virus types 1 or herpes simplex virus types 2.

33. The method of claim 28 wherein the compound of claim 1 is administered orally, parenterally or topically.

34. The method of claim 28 wherein the compound of claim 1 is in an amount of from about 0.1 to about 300 mg/kg of body weight.

35. The method of claim 28 wherein the compound of claim 1 is in an amount of from about 1 to about 30 mg/kg of body weight.

36. The method of claim 28 wherein said mammal is a human.

37. The method of claim 28 wherein said mammal is an animal.

38. A method of treating atherosclerosis and restenosis comprising administering to a mammal in need thereof a compound of claim 1 or 2.

39. A method for inhibiting a herpesviral DNA polymerase, comprising contacting the polymerase with an effective inhibitory amount of a compound of claim 1.

40. A compound of formula I, or a pharmaceutically acceptable salt thereof, for use in the manufacture of medicines for the treatment or prevention of a herpesviral infection in a mammal.

41. A compound of claim 1 which is

(1) *rac*-*N*-(4-chlorobenzyl)-2-(((2-(2-furyl)-2-hydroxyethyl)(methyl)amino)-methyl)-7-methyl-4-oxo-4,7-dihydrothieno[2,3-*b*]pyridine-5-carboxamide,

(2) (+)-*N*-(4-chlorobenzyl)-2-((((*R*)-2-(2-furyl)-2-hydroxyethyl)(methyl)amino) methyl)-7-methyl-4-oxo-4,7-dihydrothieno[2,3-*b*]pyridine-5-carboxamide,

(3) *rac*-*N*-(4-chlorobenzyl)-2-(((2-hydroxy-2-(5-methyl-2-furyl)ethyl)(methyl)-amino)methyl)-7-methyl-4-oxo-4,7-dihydrothieno[2,3-*b*]pyridine-5-carboxamide,

(4) *rac*-*N*-(4-chlorobenzyl)-2-(((2-(3-furyl)-2-hydroxyethyl)(methyl)amino)-methyl)-7-methyl-4-oxo-4,7-dihydrothieno[2,3-*b*]pyridine-5-carboxamide,

(5) *rac*-2-(((2-(1-benzofuran-2-yl)-2-hydroxyethyl)(methyl)amino)methyl)-*N*-(4-chlorobenzyl)-7-methyl-4-oxo-4,7-dihydrothieno[2,3-*b*]pyridine-5-carboxamide,

(6) *rac*-*N*-(4-chlorobenzyl)-2-(((2-hydroxy-2-thien-2-ylethyl)(methyl)amino)-methyl)-7-methyl-4-oxo-4,7-dihydrothieno[2,3-*b*]pyridine-5-carboxamide,

(7) *rac-N*-(4-chlorobenzyl)-2-(((2-hydroxy-2-(1*H*-pyrrol-2-yl)ethyl)(methyl)-amino)methyl)-7-methyl-4-oxo-4,7-dihydrothieno[2,3-*b*]pyridine-5-carboxamide,

(8) *rac-N*-(4-chlorobenzyl)-2-(((2-hydroxy-2-(1-methyl-1*H*-pyrrol-2-yl)ethyl)-(methyl)amino)methyl)-7-methyl-4-oxo-4,7-dihydrothieno[2,3-*b*]pyridine-5-carboxamide,

(9) *rac-N*-(4-chlorobenzyl)-2-(((2-hydroxy-2-(1-methyl-1*H*-imidazol-4-yl)ethyl)-(methyl)amino)methyl)-7-methyl-4-oxo-4,7-dihydrothieno[2,3-*b*]pyridine-5-carboxamide,

(10) *rac-N*-(4-chlorobenzyl)-2-(((2-hydroxy-2-(1*H*-imidazol-4-yl)ethyl)(methyl) amino)methyl)-7-methyl-4-oxo-4,7-dihydrothieno[2,3-*b*]pyridine-5-carboxamide,

(11) *rac-N*-(4-chlorobenzyl)-2-(((2-hydroxy-2-(1*H*-indol-3-yl)ethyl)(methyl)-amino)methyl)-7-methyl-4-oxo-4,7-dihydrothieno[2,3-*b*]pyridine-5-carboxamide,

(12) *rac-N*-(4-chlorobenzyl)-2-(((2-(2,5-dimethyl-3-furyl)-2-hydroxyethyl)-(methyl)amino) methyl)-7-methyl-4-oxo-4,7-dihydrothieno[2,3-*b*]pyridine-5-carboxamide,

(13) *rac*-2-(((2-(1-benzothien-3-yl)-2-hydroxyethyl)(methyl)amino)methyl)-*N*-(4-chlorobenzyl)-7-methyl-4-oxo-4,7-dihydrothieno[2,3-*b*]pyridine-5-carboxamide,

(14) *rac-N*-(4-chlorobenzyl)-2-(((2-hydroxy-2-(1-methyl-1*H*-indol-2-yl)ethyl)-(methyl)amino)methyl)-7-methyl-4-oxo-4,7-dihydrothieno[2,3-*b*]pyridine-5-carboxamide,

(15) *rac-N*-(4-chlorobenzyl)-2-(((2-(5-cyanothien-2-yl)-2-hydroxyethyl)(methyl)-amino)methyl)-7-methyl-4-oxo-4,7-dihydrothieno[2,3-*b*]pyridine-5-carboxamide,

(16) *rac-N*-(4-chlorobenzyl)-2-(((2-hydroxy-2-(1,3-thiazol-2-yl)ethyl)(methyl)-amino)methyl)-7-methyl-4-oxo-4,7-dihydrothieno[2,3-*b*]pyridine-5-carboxamide,

(17) *rac*-2-(((2-(1,3-benzothiazol-2-yl)-2-hydroxyethyl)(methyl)amino)methyl)-*N*-(4-chlorobenzyl)-7-methyl-4-oxo-4,7-dihydrothieno[2,3-*b*]pyridine-5-carboxamide,

(18) *rac-N*-(4-chlorobenzyl)-2-(((2-hydroxy-2-(1*H*-pyrazol-5-yl)ethyl)(methyl)-amino)methyl)-7-methyl-4-oxo-4,7-dihydrothieno[2,3-*b*]pyridine-5-carboxamide,

(19) *N*-(4-chlorobenzyl)-2-((((2*R*)-2-hydroxy-2-(1*H*-pyrazol-5-yl)ethyl)(methyl)-amino)methyl)-7-methyl-4-oxo-4,7-dihydrothieno[2,3-*b*]pyridine-5-carboxamide,

(20) *N*-(4-chlorobenzyl)-7-ethyl-2-((((2*R*)-2-(2-furyl)-2-hydroxyethyl)(methyl)-amino)methyl)-4-oxo-4,7-dihydrothieno[2,3-*b*]pyridine-5-carboxamide,

(21) *N*-(4-chlorobenzyl)-2-((((2*R*)-2-(2-furyl)-2-hydroxyethyl)(methyl)amino)-methyl)-7-(2-methoxyethyl)-4-oxo-4,7-dihydrothieno[2,3-*b*]pyridine-5-carboxamide,

(22) *rac*-2-(((2-(1-benzofuran-2-yl)-2-hydroxyethyl)(methyl)amino)methyl)-*N*-(4-chlorobenzyl)-7-ethyl-4-oxo-4,7-dihydrothieno[2,3-*b*]pyridine-5-carboxamide,

(23) *rac*-2-(((2-(1-benzofuran-2-yl)-2-hydroxyethyl)(methyl)amino)methyl)-*N*-(4-chlorobenzyl)-7-propyl-4-oxo-4,7-dihydrothieno[2,3-*b*]pyridine-5-carboxamide,

(24) *rac*-2-(((2-(1-benzofuran-2-yl)-2-hydroxyethyl)(methyl)amino)methyl)-*N*-(4-chlorobenzyl)-7-(2-methoxyethyl)-4-oxo-4,7-dihydrothieno[2,3-*b*]pyridine-5-carboxamide,

(25) *rac*-2-(((2-(1-benzofuran-2-yl)-2-hydroxyethyl)(methyl)amino)methyl)-*N*-(4-chlorobenzyl)-7-(2,3-dihydroxypropyl)-4-oxo-4,7-dihydrothieno[2,3-*b*]pyridine-5-carboxamide,

(26) *N*-(4-chlorobenzyl)-7-(2,3-dihydroxypropyl)-2-((((2*R*)-2-(2-furyl)-2-hydroxyethyl)(methyl)amino)methyl)-4-oxo-4,7-dihydrothieno[2,3-*b*]pyridine-5-carboxamide,

(27) *N*-(4-chlorobenzyl)-2-((((2*R*)-2-(2-furyl)-2-hydroxyethyl)(methyl)amino)-methyl)-7-(3-hydroxypropyl)-4-oxo-4,7-dihydrothieno[2,3-*b*]pyridine-5-carboxamide,

(28) *rac*-2-(((2-(1-benzofuran-2-yl)-2-hydroxyethyl)(methyl)amino)methyl)-*N*-(4-chlorobenzyl)-7-(3-hydroxypropyl)-4-oxo-4,7-dihydrothieno[2,3-*b*]pyridine-5-carboxamide,

(29) *rac*-2-(((2-(1-benzofuran-2-yl)-2-hydroxyethyl)(methyl)amino)methyl)-*N*-(4-chlorobenzyl)-7-(2-hydroxyethyl)-4-oxo-4,7-dihydrothieno[2,3-*b*]pyridine-5-carboxamide,

(30) *rac-N*-(4-chlorobenzyl)-2-(((2-(4,5-dimethyl-2-furyl)-2-hydroxyethyl)(methyl)-amino)methyl)-7-methyl-4-oxo-4,7-dihydrothieno[2,3-*b*]pyridine-5-carboxamide,

(31) *rac-N*-(4-chlorobenzyl)-2-(((2-(5-phenyl-2-furyl)-2-hydroxyethyl)(methyl)-amino)methyl)-7-methyl-4-oxo-4,7-dihydrothieno[2,3-*b*]pyridine-5-carboxamide,

(32) *N*-(4-chlorobenzyl)-2-((((2*R*)-2-(2-furyl)-2-hydroxyethyl)(methyl)amino)-methyl)-4-oxo-7-propyl-4,7-dihydrothieno[2,3-*b*]pyridine-5-carboxamide,

(33) *N*-(4-chlorobenzyl)-2-(((2-(5-chloro-2-furyl)-2-hydroxyethyl)(methyl)amino)-methyl)-7-methyl-4-oxo-4,7-dihydrothieno[2,3-*b*]pyridine-5-carboxamide,

(34) *N*-(4-chlorobenzyl)-2-((((2*R*)-2-(2-furyl)-2-hydroxyethyl)(methyl)amino)-methyl)-7-(2-hydroxyethyl)-4-oxo-4,7-dihydrothieno[2,3-*b*]pyridine-5-carboxamide,

(35) *N*-(4-chlorobenzyl)-2-((((2*R*)-2-(2-furyl)-2-hydroxyethyl)(methyl)amino)-methyl)-7-(2-(2-hydroxyethoxy)ethyl)-4-oxo-4,7-dihydrothieno[2,3-*b*]pyridine-5-carboxamide,

(36) *rac*-*N*-(4-chlorobenzyl)-2-(((2-hydroxy-2-(1*H*-imidazol-2-yl)ethyl)(methyl)-amino)methyl)-7-methyl-4-oxo-4,7-dihydrothieno[2,3-*b*]pyridine-5-carboxamide, or a pharmaceutically acceptable salt thereof.

42. A compound of claim 1 which is (+)-*N*-(4-chlorobenzyl)-2-((((*R*)-2-(2-furyl)-2-hydroxyethyl)(methyl)amino)methyl)-7-methyl-4-oxo-4,7-dihydrothieno[2,3-*b*]-pyridine-5-carboxamide, or a pharmaceutically acceptable salt thereof.